

Name _____

Algebra 1 Summer Packet

Show show all work. Good luck! 😊

1. Which of the following is equivalent to the expression shown below?

$$9^{-5} \cdot (-7)^8$$

A. $\frac{1}{9^5 \cdot 7^8}$

C. $\frac{(-7)^8}{9^5}$

B. $(-9)^5 \cdot (-7)^8$

D. $-(9^5 \cdot 7^8)$

2. Which number is both a perfect square and a perfect cube number?

A. 9

B. 27

C. 64

D. 125

3. Between which two consecutive numbers does the square root below lie?

$$-\sqrt{128}$$

A. -13 and -12

B. -12 and -11

C. -11 and -10

D. -10 and -9

4. If the set below is ordered from least to greatest, which value could go in the box?

$$\left\{ 6^{-2}, \boxed{?}, \frac{2}{7} \right\}$$

A. 4%

C. 1×10^{-2}

B. 2^{-6}

D. 30%

5. Which value is an integer but not a whole number?

A. 75%

B. $5^{-1} \cdot 10$

C. $\sqrt{20}$

D. $-\frac{4^3}{16}$

6. Simplify the expression below.

$$\frac{5^3 - |-19| + 2}{(5 + 2^2) \cdot 3}$$

A. $-\frac{2}{27}$

C. $\frac{147}{146}$

B. 4

D. -20

7. If
- $a = -4$
- and
- $b = \frac{4}{3}$
- , find the value of the expression below.

$$\frac{1}{6}a^2 + \frac{9}{10}b$$

A. $-\frac{2}{15}$

C. $\frac{38}{15}$

B. $-\frac{22}{15}$

D. $\frac{58}{15}$

8. Which expression could be placed in the box as an example of the associative property?

$$8 \cdot (m^2 \cdot n^2) = \boxed{?}$$

A. $8 \cdot (m \cdot n)^2$

C. $(8 \cdot m^2) \cdot n^2$

B. $8m^2 \cdot 8n^2$

D. $(m^2 \cdot n^2) \cdot 8$

9. Once simplified, which expression is not equivalent to the other three expressions?

- A. $4(7 - 2m) - 10$
- B. $-5m - 11 - 3m + 29$
- C. $m - (9m + 1) + 17$
- D. $12 + 4m - 3(4m - 2)$

10. Simplify, then completely factor the expression below.

$$6(4y + 7) - 3(2y - 1)$$

- A. $3(6y + 15)$
- B. $3(6y + 13)$
- C. $9(2y + 5)$
- D. $9(2y + 3)$

11. Find the solution to the equation below.

$$2(4w - 3) = -2(2w + 15)$$

- A. $w = -2$
- B. $w = -3$
- C. $w = -6$
- D. $w = -9$

12. Find the solution to the equation below.

$$5(2a - 3) = 13a - 3(a - 5)$$

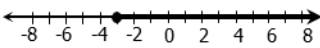
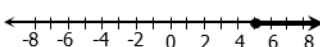
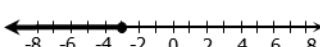
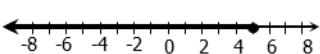
- A. $a = -2$
- B. $a = 5$
- C. No Solution
- D. Infinite Solution

13. Which of the following relations is not a function?

- A. $\{(5, 5), (6, 6), (7, 7), (8, 8)\}$
- B. $\{(-3, 1), (-4, 1), (-5, 1), (-6, 1)\}$
- C. $\{(4, -5), (4, 7), (4, 1), (4, -1)\}$
- D. $\{(0, 0), (4, 5), (5, 0), (3, 4)\}$

14. Which graph represents the solution to the inequality below?

$$-\frac{1}{2}(8a - 32) \leq -4$$

- A. 
- B. 
- C. 
- D. 

15. Which of the following values is a solution to the inequality below?

$$7n + 8 > 9n + 14$$

- A. 1
- B. 2
- C. -3
- D. -4

16. Translate and solve: "The difference between two-thirds of a number, n , and eleven is at least 17".

- A. $n \leq 9$
- B. $n \leq 42$
- C. $n \geq 9$
- D. $n \geq 42$

17. Simplify the expression shown below.

$$\frac{-12n^{10}}{4n^2}$$

A. $-3n^8$

C. $-3n^5$

B. $\frac{n^8}{3}$

D. $\frac{n^5}{3}$

18. Simplify the expression shown below.

$$9x^4y^3 \cdot 5x^2y^{-5}z^0$$

A. $\frac{45x^8}{y^{15}}$

C. $\frac{45x^8z}{y^{15}}$

B. $\frac{45x^6z}{y^2}$

D. $\frac{45x^6}{y^2}$

19. Which expression does not simplify to $27k^{12}$?

A. $12k^{-2} \cdot \frac{9}{4}k^{14}$

B. $\frac{81k^9}{3k^{-3}}$

C. $9k^3 \cdot 3k^4$

D. $(3k^4)^3$

20. When placed in the box, which exponent makes the statement true?

$$\frac{c^{\boxed{?}}}{c^{-2}} = \frac{1}{c^3}$$

A. 6

B. -5

C. -1

D. -6

21. Find the sum of 4.9×10^{-8} and 7×10^{-9} .

A. 1.19×10^{-16}

B. 1.19×10^{-18}

C. 5.6×10^{-8}

D. 5.6×10^{-9}

22. A company manufactured 1.8×10^9 light bulbs last year. Each light bulb is checked for defects before packaging. If 2% were found to have defects, how many had defects?

A. 3.6×10^7

B. 3.6×10^8

C. 2.16×10^5

D. 2.16×10^6

23. In a 5-day work week, Matt puts 175 miles on his car. His wife, Sarah, puts 100 more miles on her car than he does in the same amount of time. How many total miles will they put on their cars in 28 workdays?

A. 1,560 miles

B. 2,520 miles

C. 2,780 miles

D. 2,940 miles

24. A map uses a scale of $\frac{5}{8}$ inch = 50 miles. If two cities are $1\frac{3}{4}$ inches apart on the map, find their actual distance.

A. 90 miles

B. 110 miles

C. 125 miles

D. 140 miles

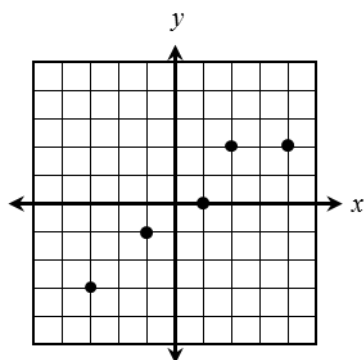
25. The aquarium charges \$12 per ticket for adults and \$5 per ticket for children. A group of 90 children and adult chaperones visited the aquarium on a field trip. If the total cost of their tickets was \$548, how many chaperones were there?

- A. 12
- B. 13
- C. 14
- D. 15

26. Find the slope of the line that passes through the points $(-1, -2)$ and $(-9, -2)$.

- A. $-\frac{1}{2}$
- B. 0
- C. $\frac{1}{2}$
- D. undefined

27. What is the range of the relation plotted on the graph?

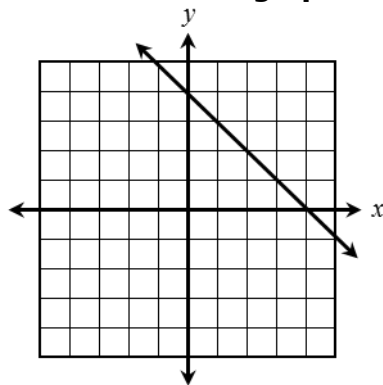


- A. $\{-3, -1, 1, 2, 4\}$
- B. $\{-3, -1, 0, 2\}$
- C. $\{-3, -1, 1, 2\}$
- D. $\{-3, -1, 0, 1, 2, 4\}$

28. Which equation represents a linear function?

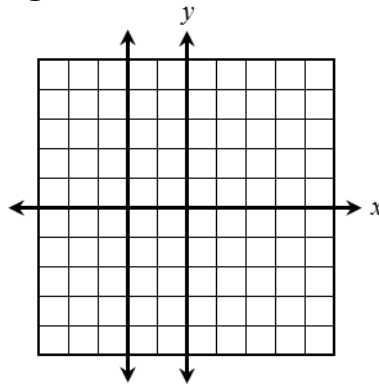
- A. $y = \frac{x}{5}$
- B. $xy = 18$
- C. $x^2 + y^2 = 4$
- D. $y = 2x^3 + 1$

29. Which equation best represents the line shown on the graph?



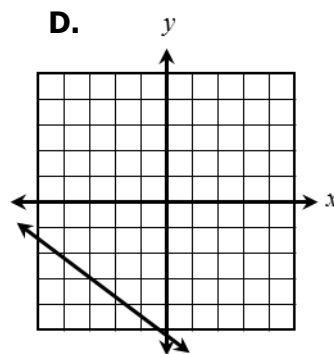
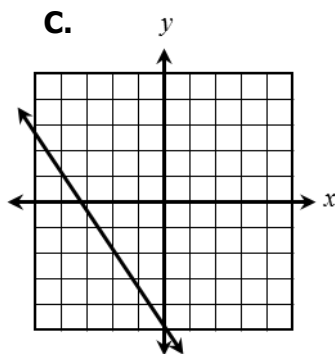
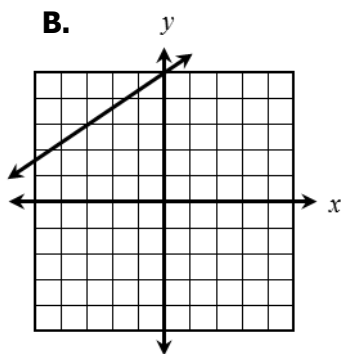
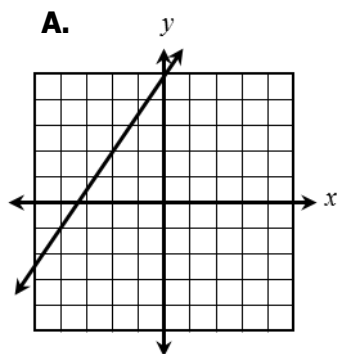
- A. $y = -x + 4$
- B. $y = -4x$
- C. $y = 4x - 1$
- D. $y = -4x + 4$

30. What is the slope of the line shown on the grid below?

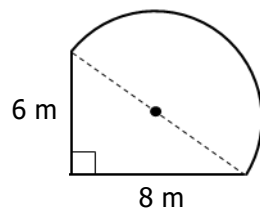


- A. -2
- B. 1
- C. 0
- D. undefined

31. Which graph shows the line $3x - 2y = -10$?

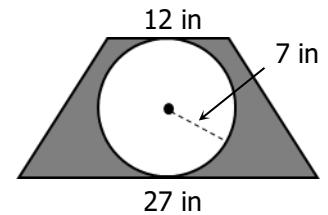


32. What is the perimeter of the shape shown below?



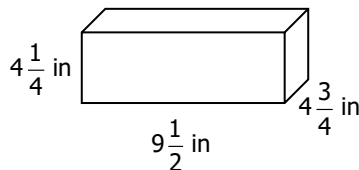
- A. $P = 29.7$ m
- B. $P = 36.0$ m
- C. $P = 45.4$ m
- D. $P = 58.0$ m

33. Find the area of the shaded region to the nearest tenth.



- A. $A = 105.5$ in²
- B. $A = 119.1$ in²
- C. $A = 127.4$ in²
- D. $A = 133.8$ in²

34. A box of tissues has the dimensions shown below. What is the minimum amount of extra cardboard needed if one inch is added to the height of the box?

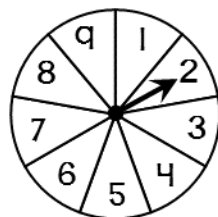


- A. 18.5 in²
- B. 21.4 in²
- C. 25.3 in²
- D. 28.5 in²

35. The soccer team and the lacrosse team sold tubs of cookie dough as a fundraiser. Each tub sold earns \$5 in profit. If the soccer team sold thirteen less than twice the number of tubs that the lacrosse team sold, and the two teams sold 224 tubs combined, how much money did the soccer team raise?

- A. \$395
- B. \$440
- C. \$725
- D. \$855

36. The spinner below is spun once, then a letter from the word CHAMPION is chosen at random. Find the probability of getting a number less than 3, then a vowel.



- A. $\frac{1}{12}$
- B. $\frac{1}{8}$
- C. $\frac{1}{9}$
- D. $\frac{1}{24}$

37. A cup contains seven red erasers, four yellow erasers, nine blue erasers, and five green erasers. Samantha chose an eraser at random, did not replace it, and chose another. What is the probability that both erasers chosen were blue?

- A. $\frac{7}{50}$
- B. $\frac{27}{200}$
- C. $\frac{9}{25}$
- D. $\frac{3}{25}$

38. The data below gives the running time, in minutes, for a set of 12 movies.

{84, 112, 95, 127, 89, 135, 102, 97, 122, 92, 135, 118}

Which statement is true?

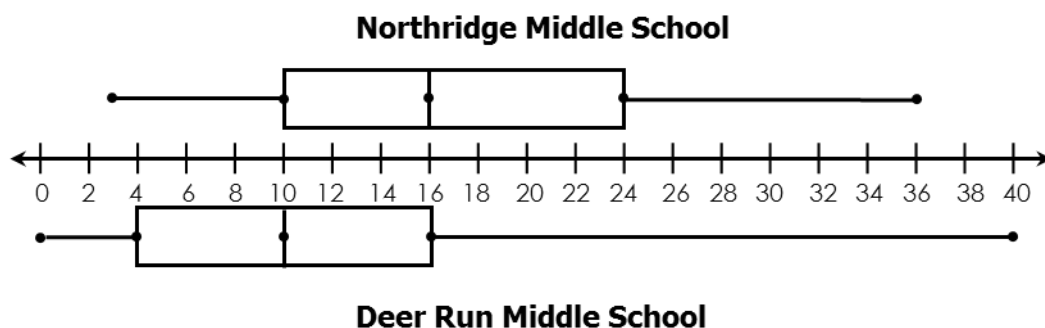
- A. The mean is greater than the median.
- B. The mean is less than the median.
- C. The median is greater than the mode.
- D. The mode is less than the range.

39. The table below shows the points scored by two football teams in their first five games of the season. How many points must the Tigers score in their next game so their mean number of points is equal to the Hawks' mean number of points?

Hawks	30, 36, 28, 30, 21
Tigers	28, 33, 17, 20, 39

- A. 36
- B. 37
- C. 38
- D. 39

40. The box-and-whisker plot below shows the number of years of teaching experience that each teacher has at two different schools, Northridge Middle School and Deer Run Middle School. Northridge has 92 teachers, each with a different number of years experience. Deer Run has 116 teachers, each with a different number of years experience. What is the total number of teachers at the two schools with at least 10 years of experience?



- A. 115
- B. 120
- C. 127
- D. 133

For questions 41 – 48: Identify the property that justifies the statement. *Use the property bank.*

41. If $y = -5$, then $-5 = y$	42. $8a + 4 = 4 + 8a$
43. $12(x + 4) = 12x + 48$	44. $n^2 \cdot 0 = 0$
45. $8 + (2 + 6) = (8 + 2) + 6$	46. If $3^2 = 9$ and $9 = \sqrt{81}$, then $3^2 = \sqrt{81}$
47. $-7 = -7$	48. $6s \cdot \frac{1}{6s} = 1$

Property Bank:

Commutative
Associative
Distributive
Identity
Inverse
Property of Zero
Reflexive
Symmetric
Transitive